Use of an image intensifier for the localization and removal of a foreign body in the lower lip

Uso de intensificador de imagem para localização e remoção de corpo estranho em lábio superior

Uso de un intensificador de imagen para localización y eliminación de cuerpo extraño en el labio inferior

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3We present a case of 44-year-old male complaining an unusual foreign body in the lower lip region. Radiography did not reveal the exact location, and did not let a resolution at first time. Subsequently, the surgical treatment was effective with the aid of navigation-assisted fluoroscopy that showed the precise location of the foreign body for removal and avoided more discomfort to the patient.

Descriptors: Foreign Bodies; Fluoroscopy; Traumatology.

Abstract

Foreign bodies can be found in the soft tissues of the face and in the maxillary bones in routine radiographic examinations. In the majority they do not present symptomatology. The removal of foreign bodies without the accurate location can cause severe complications. We present a case of 44-year-old male complaining an unusual foreign body in the lower lip region. Radiography did not reveal the exact location, and did not let a resolution at first time. Subsequently, the surgical treatment was effective with the aid of navigation-assisted fluoroscopy that showed the precise location of the foreign body for removal and avoided more discomfort to the patient.

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INTRODUCTION

The presence of foreign body (FB) is constantly a surgical challenge, especially on maxillofacial region2. FBs are a hazard when inside the submucosal tissue; due to anatomical proximity to critical nerves and vessels structures that can be injured, thus often they require removal2. In addition, the surgery without the precise location can cause severe complications such as infection, bleeding and hematoma7. Therefore, the removal of them is supposed to be a risk factor in maxillofacial surgery.

It is essential detect the exact location of FB for removal2,4. However, identifying the position of these objects and determining a safe surgical approach are difficult using conventional preoperative radiography5. For this reason, several methods have been used, such as: plain radiographs, computed tomograms, magnetic resonance, and ultrasound, nonetheless an accurate determination of its location in the complex craniofacial region can be difficult, mainly if the FB is not next to an anatomic landmark5.

Fluoroscopy, using an x-ray machine with an image intensifier, has applications in many parts of medicine6. It was first used in neurosurgery to improve the imaging of brain tumors, cysts, edema and diagnosis of central nervous system diseases. The benefit exceeds surgery on the brain; fluoroscopy has been used a non-invasive method for guided surgical, due to the accuracy of location for removal of FB5. Also others reports demonstrate that fluoroscopy improves

the management and resolution to removal of broken instruments and needles in soft and hard tissue3,8-9.

In this case, the authors share their experience of an ineffectual tentative attempt of removal an unusual FB with conventional preoperative radiography and the effective resolution with the aid of a fluoroscopy for the localization and removal of a foreign body in the lower lip.

CLINICAL CASE

A 44-year-old male patient was referred to the Maxillofacial Surgery Service from FOA-UNESP, for treatment of a FB (fish-hook fragment) in the lower lip region. The patient hit him in the face and embedded in his lower lip a fish-hook, had cut off part of the foreign body previously by himself, and the rest remained inside lower lip subcutaneous region. Patient denied habits, allergies and comorbidity. Extraorally, he showed edema and a little entry hole of the FB in the lower lip. The FB was not clinically palpable. At first, it was performed an attempt of removal with local anesthesia, and aid of a conventional preoperative radiography. Additional with the problematic that the FB was not palpable, also it was difficult to determine the correct position of FB in the plans radiography, (Figures land 2), consequently was not detected the FB in the first approach. After 1 week, a surgical navigation with a mobile fluoroscopy “C-arm” (Siemens AG, Multimobil 5c model, German) under
local anesthesia was performed. In this time, the exact position of the foreign body was demarcated in the real-time image, by using a pen tip positioned externally to lower lip as reference, showing the exact position of FB in relation with the pen tip in the treatment area (Figures 3 and 4). Therewith, the treatment with use of the fluoroscopy was successful, being possible to determine the direction of the local approach, and consequently removal of FB precisely and quickly. (Figure 5).

![Figure 1](image1.png)
**Figure 1:** Plain Radiography in the first and difficult attempt to locate the foreign body (red squares).

![Figure 2](image2.png)
**Figure 2:** Plain Radiography in the first and difficult attempt to locate the foreign body (red squares).

![Figure 3](image3.png)
**Figure 3:** Fluoroscopy image showing the foreign body location (red square) with reference of a tip pen attached externally (blue square) and the anatomical spatial relationship.

![Figure 4](image4.png)
**Figure 4:** Fluoroscopy image with magnification that demonstrated exactly the location of foreign body (red square) in relation with the tip pen (blue square).

![Figure 5](image5.png)
**Figure 5:** Foreign body removed (fish-hook fragment).

**DISCUSSION**

An adequate method is necessary to determine the exact location of a FB in the maxillofacial region, although the methods of removing are yet controversial. Our experience demonstrated that the removal of foreign bodies located in soft tissue could be more efficient with the aid of fluoroscopy method, mainly after a prior unsuccessful attempt of location with conventional radiography. Fluoroscopy get effectual results to the surgeon and subsequently beneficial to patient to treat FB in the maxillofacial region.

In support with this experience, recent reports show that the fluoroscopy has a high success rate to determine the precise location of FB when compared with the conventional radiography method. In our case was also possible to note that the image intensifier provided a precise localization in relation with anatomy spatial relationships (Figure 3) that made more feasibly the removal than the plain radiography at first. In addition, as example our case, fluoroscopy leads a minimally invasive procedure, minimizing scars and injury to patient, considering the aesthetics aspects of face.

Studies demonstrated that image intensifier is a useful and safe method to detect FB preoperative and intraoperative. A advantage, this technique allows to obtain images of the foreign body's location in relation to the surgeon's tool reference, such as the tip pen placed extraoral in our case. Thus, it permit a dimensional location of approach and incision placement along the object, preserving anatomic structures, as well decrease the possibility of cross-operative complications; reduce surgical time and tissue manipulation, as also described.

The fluoroscopy besides permit guide with surgeon’s tool reference also can provide real-time images that are fundamental to locate FB in soft tissue. This advantages need to be considered, due to the tendency for a FB to move deeper soft tissues. In addition, as example of our case, should consider the fish-hook’s shape barbed inside the soft tissue, once that the retrograde movement can damage important structures. Based in this case, fluoroscopy showed to be an effective alternative for the removal of FB retained in the soft tissues, since it is precise, fast, with minimum risk of complications.

**CONCLUSION**

The authors suggest that in presence of foreign bodies in the maxillofacial region, the use of fluoroscopy as first choice is a reliable method for removal, avoiding discomfort to patient.

**REFERENCES**


CONFLICTS OF INTERESTS

The authors declare no conflicts of interests.

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